HONORS – Proving Polynomial Identities Notes

We can prove polynomial identities by: work on one side to show it equals the other

1) $(a-b)^2 = a^2 - 2ab + b^2$

$(a-b)^2$ (Given)

$(a-b)(a-b)$ (property of exponents)

$a^2-ab-ab+b^2$ (FOIL)

$a^2-2ab+b^2$ (combine like terms)

/QED

2) $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

$(a+b)(a^2-ab+b^2)$ (given)

$a^3-a^2b+ab^2+a^2b-ab^2+b^3$ (mult. Poly)

a^3+b^3 (combine like terms)

/QED

3) $(ax+b)(x+a) = ax^2 + a^2x + bx + ab$

$(ax+b)(x+a)$ (given)

$ax^2+a^2x+bx+ab$ (mult. Poly)

/QED

4) $(3x+4y)^2 = 9x^2 + 24xy + 16y^2$

$x=1 \quad y=2$

$(3\cdot1+4\cdot2)^2 = 9(1)^2+24(1)(2)+16(2)^2$

$(3+8)^2 = 9+48+64$

$(11)^2 = 121$

$121 = 121$ ✓